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ABSTRACT

This pamphlet discusses the influence parents have on the Attitudes of their daughters toward mathematics and ways parents can nurture math talent. Recommendations for parents include: (1) at-home activities that involve hands-on problem solving, such as blocks and tinker toys; (2) engage in daily math routines such as determining the appropriate tip to leave at a restaurant or determining unit prices for items at the grocery store; (3) visit museums of science where she can explore the contributions mathematics has made to scientific discovery; (4) collaborate with teachers in flexible and creative ways to make sure students are challenged and energized in mathematics; (5) encourage participation in math clubs and competitions; (6) explore varied careers in mathematical fields; and (7) provide female role models. A list of research facts is provided that indicate parents of females are more likely to report that mathematics is less important than other subjects and more difficult for females, girls do not come to the mathematics classroom with the same experiences as boys, there is a gender gap on standardized test results, and there is a new gender gap in technology. (Contains 29 references.) (CR)

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National Research Center on the Gifted & Talented

What Parents Need To Know about... Encouraging Talented Girls in Mathematics.

Practitioners' Guide A0021

M. Katherine Gavin

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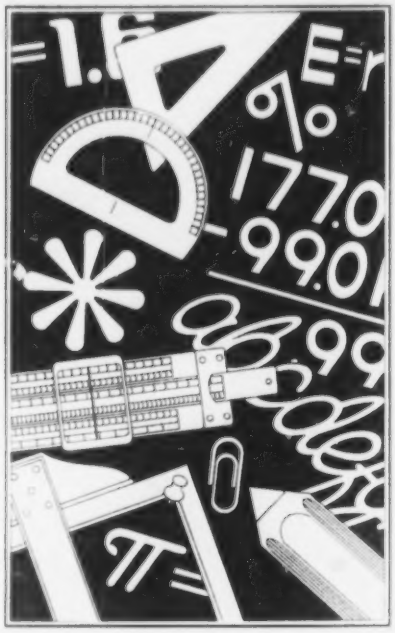
What parents need to know about . . .



Encouraging Talented Girls in Mathematics

M. Katherine Gavin

Females are presented with a double argument in mathematics: They can not do mathematics and they should not do mathematics.

Suzanne Damarin (1995)

EC 308363

The National Research Center on the Gifted and Talented
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Implications for the Home

Commentators now proclaim on the airwaves that gender bias no longer exists. It is true that we have made progress in affording equal opportunities to girls and boys. However, it is also true that we still have a long way to go. Research has demonstrated that parents along with peers have the greatest influence over student scholastic performance (Eccles & Jacobs, 1986; Leder, 1992). Specifically with respect to mathematics, parents' level of education, their attitudes towards mathematics, their self-confidence in mathematics or lack thereof, and their stereotypical beliefs about their daughter's mathematical abilities all have strong influences on their child.

Getting Beyond Math Anxiety

Math anxiety is a very real phenomenon in our society and is not just relegated to students. Parents often readily admit to teachers that they were never good at math or never had any use for the algebra they learned in high school. They make excuses for their child's lack of success by admitting their own. Parents need to value the importance of mathematics in our technological society and promote it rather than bemoan it.

Exploring Math at Home and on the Road

At-home activities that involve hands-on problem solving give students an advantage in the math classroom by bolstering confidence and providing an intuitive understanding of math concepts. Frequently, girls lack these kinds of extracurricular experiences. Provide your daughter with blocks and tinker toys with which to build and create. Encourage her to take apart her bicycle, repair her portable tape player, work on jigsaw puzzles,

and set up her computer on her own. These experiences promote spatial sense underlying mathematical problem solving and geometric understanding.

Research has shown that girls need to see the usefulness of mathematics in everyday life and its connection to the real world (Fennema & Peterson, 1985). Engage your daughter in daily math routines such as determining the appropriate tip to leave at a restaurant or finding unit prices for items at the grocery store. Visit museums of science where you can explore together the contributions mathematics has made to scientific discovery. Encourage her to attend computer camp where she can interact with technology and experiment with mathematical techniques.

Nurturing Math Talent

Especially with young girls (ages 4 to 7), parents often are the key to recognizing and developing math talent. It is very important that parents collaborate with teachers in a flexible and creative way to make sure their daughter is challenged and energized in mathematics. At home, parents need to make sure they engage their daughters in talk about numbers as often as they do their sons. An environment that encourages young girls to problem solve and figure things out on their own will go a long way to nurturing their talent and enjoyment of mathematics (Waxman, Robinson & Mukhopadhyay, 1996).

Gender Equity? Oh, yes, that was a hot topic a few years ago. Hasn't that been taken care of?

Lack of self-confidence is a major deterent for adolescent girls to pursue mathematics. This is true even for females with special talents in this area (Siegle & Reis, 1995; Terwilliger & Titus, 1995). Parental recognition of talent and belief in the ability of their daughter are major factors in promoting self-confidence in mathematics for girls. Encourage your daughter's mathematical talent. Suggest she join math clubs and competitions, enroll in honors and advanced placement courses, and continue mathematics in college and beyond. Explore local and regional summer opportunities for further study in math.

Research has shown that girls have little knowledge about the career opportunities connected with mathematics (Gavin, 1997). Learn with your daughter about the varied careers in mathematical fields. Seek out mentorships and internships with female role models; for example, actuaries, professors of mathematics, architects, engineers, and physicists.

Provide female role models in your daughter's everyday life such as her doctor, dentist, and the family veterinarian. Encourage her to read literature that features strong female protagonists, including biographies of female mathematicians and scientists.

Research Facts

- Parents of females are more likely to report that mathematics is less important than other subjects and more difficult for females. They often attribute their daughter's good mathematics performance to effort rather than ability (Parsons, Adler, & Kaczala, 1982).

- In general, girls do not come to the mathematics classroom with the same experiences as boys. They have had less opportunities to manipulate objects, to build, and to problem solve using spatial reasoning (Leder, 1990).

- Although girls get higher grades in mathematics consistently throughout school, the gender gap in standardized test results favors boys, especially for talented mathematics students. (American Association of University Women, 1992; Sadker, 1999). Since PSAT scores are used to determine National Merit Finalists, this can result in the loss of scholarships for girls.

- Often girls who excel in mathematics are good in other subject areas as well. Parents frequently encourage their daughters to pursue further studies in areas more socially acceptable such as English and history, rather than mathematics (Eccles, 1984). Furthermore, when it comes to college and career, parents tend to encourage their daughters to go to college, while encouraging their sons to go to college **and** pursue a specific career (Reis, Callahan, & Goldsmith, 1996).

- Although mathematics is vital to the future of our technological society, far more males than females pursue careers in math-related fields. Females comprise approximately 32% of mathematical and computer scientists, 27% of natural scientists, and a mere 8% of engineers (U.S. Census Bureau, 1996).

- A new gender gap exists in technology. Girls have less computer experience outside of school and are less comfortable with computers than boys. In school, girls often enroll in word processing courses, while boys take advanced computer science courses (Sadker, 1999).

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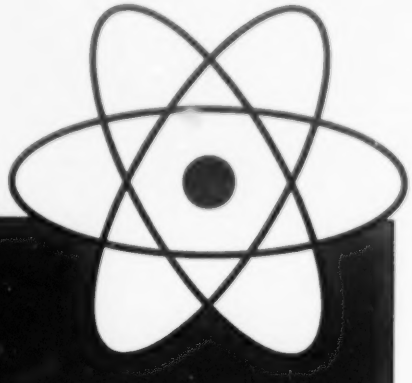
Organizations

American Association of University Women
1111 Sixteenth Street NW
Washington, DC 20036-4873
(800) 326-AAUW
info@aauw.org
www.aauw.org

The Association for Women and Mathematics (AWM)
4114 Computer & Space Sciences Building
University of Maryland
College Park, MD 20742-2461
(301) 405-7892
awm@math.umd.edu
www.awm-math.org

EQUALS Programs
Lawrence Hall of Science
University of California
Berkeley, CA 94720-5200
(510) 642-1823
equals@uclink.berkeley.edu
equals.lhs.berkeley.edu

Math/Science Network
Mills College
5000 MacArthur Boulevard
Oakland, CA 94613-1301
(510) 430-2222
msneyh@mills.edu
www.expandingyourhorizons.org



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National Education Association
1201 Sixteenth Street NW
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www.nea.org

National Women's History Project
7738 Bell Road
Windsor, CA 95492-8518
(707) 838-6000
nwhp@aol.com
www.nwhp.org

Women's Educational Equity Act (WEEA) Publishing Center
Educational Development Center, Inc.
55 Chapel Street - Suite 200
Newton, MA 02158-1060
(800) 225-3088
weeapub@edc.org
www.edc.org

Women and Mathematics Education
SummerMath
Mount Holyoke College
50 College Street
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www.mtholyoke.edu/proj/summermath

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